

## Remarks

Claims 1, 3, 4, 6-13, and 30-50 are pending in the application and stand rejected. Claims 1, 31, 32, 43-46, and 50 have been amended, and claims 30, 36, 37, 47 and 48 have been canceled. Claims 51 and 52 have been added. No new matter is added to the Specification by these changes. Applicant respectfully requests reexamination and reconsideration of the case, as amended. Each of the rejections levied in the Office Action is addressed individually below.

**I. Rejection under 35 U.S.C. § 112, first paragraph.** Claims 1, 3, 4, 6-8, 10, 11, 13, and 30-50 stand rejected under 35 U.S.C. § 112, first paragraph, for containing new matter. Examiner has requested that Applicant specifically point out support for many of the amendments to the claims made in the last Response filed February 20, 2002.

In claims 1, 30, and any claims dependent therefrom, Examiner has objected to the language “the peptides and proteins are not intermediates leading to a single final product” for lack of support. The Examiner has also objected to the language “the array has linear organization” as recited in claims 1, 30, 31, 32, and 50, and the Examiner has objected to the language “the peptides or proteins are arranged one-dimensionally” in claim 36. In addition, the Examiner has objected to language found in claims 31, 32, 33, and 50 including the limitations “first [and additional] set of reagents or reaction conditions”, “first [and second] specific spatial period”, and “first [and additional] set of compounds” where each compound within the set “being related to all other compounds in the first [or additional] set as a product of the first set of reagents or reaction conditions.” The Examiner has stated that there does not appear to be support in the Specification for the language “the peptides or proteins are not fluorescent” or “at least one peptide or protein is not fluorescent” as found in claims 47 and 48. Lastly, the Examiner states that various limitations, “separated by a constant interval,” “present at at least two different positions,” “present at only one different position,” “first synthesis product,” “second synthesis product,” and “chemical structures,” in claims 38-42 and 43-46 do not appear to have support in the Specification. The Examiner states that there does not appear to be

support for these specific limitations and requests that the Applicant specifically point to support for these limitations within the Specification. Applicant respectfully disagrees that these added limitations constitute new matter and below points to support for each of these amendments in the Specification as originally filed.

For the language “the peptides and proteins are not intermediates leading to a single final product,” Applicant would first like to draw the Examiner’s attention to Figures 1-3 of the parent application USSN 09/253,153, which is incorporated by reference, depicting the synthesis of a combinatorial library on a thread thereby illustrating the claimed invention. As one of skill in the art would appreciate, the peptides and proteins of the linear array are not intermediates at various stages in the synthesis of one final product. The peptides and proteins of the claimed invention are rather fully synthesized compounds. In other words, one could not take the peptides or proteins of the array and subject them to additional reactions (*e.g.*, coupling reaction to add more amino acids) and arrive at the same final product. The compounds of the array are each final products *per se*. Further support for this idea can be found in the parent ‘153 application starting on page 9, line 26 and continuing to page 11 describing the preparation of the claimed invention and on page 17, line 26, and continuing to page 21 describing an actual preparation of a linear array of peptides on a string. Nowhere in the application is described the idea of creating diversity in the library by halting the synthesis of the library in the midst of the steps needed to create the full library. In contrast, the compounds of the claimed arrays are all approximately the same size. For example, in the case of a polypeptide library, all the polypeptides will have approximately the same number of amino acids. A claimed polypeptide array would not include a first compound that is a single amino acid and a second compound that is a 20-mer. Applicant respectfully submits that the new matter rejection be removed in light of the support for this limitation in the Specification as originally filed because clearly one of ordinary skill in the art reading this application would realize that the Applicant was not trying to claim an array of intermediates along a pathway leading to a single final product.

Support for the “linear organization” and “arranged one-dimensionally” language in claims 1, 30, 31, 32, 50, and 32 can be found in the claims of the parent application as well as on page 3, line 28, and on page 4, line 17-18, of the present application. Also, given that fact that the optical fiber is a linear structure and the figures of the present Application depict a linear

array of agents on the fiber, one of ordinary skill in the art would understand that the Applicant had possession of the claimed invention at the time the Application was filed. Applicant therefore submits that there was adequate written description support for the added language "linear organization" and "arranged one-dimensionally."

Support for the various language in claims 31, 32, 33, 38-46, 50, and dependent claims thereof with respect to "first [and additional] set of reagents or reaction conditions," "first [and second] specific spatial period," "separated by a constant interval," "present at at least two different positions" can be found starting on page 9, line 26 and continuing to page 11 of the parent application, which was incorporated by reference into the present Application, describing a typical preparation of the claimed invention. Further support for the language in the claims at issue can be found starting on page 22, line 25, and continuing to page 23, line 7, and Figures 1-3 of the parent application. In view of the support for claims 31, 32, 33, 38-46, and 50, Applicant requests that the rejection be removed.

In regard to the rejection of claims 47 and 48 and the language "the peptides or proteins are not fluorescent" or "at least one peptide or protein is not fluorescent," Applicant submits that one of ordinary skill in the art would not expect proteins or peptides to be fluorescent. Therefore, one of ordinary skill in the art would appreciate that the Applicant had possession of the invention wherein the peptides or proteins are not fluorescent. However, in order to further prosecution, Applicant has canceled claims 47 and 48 thereby obviating this rejection.

In the present Amendment, Applicant has further amended the claims to recite that the peptides or proteins of the array are members of a combinatorial library and that each compound is represented in the array at least twice at discontinuous portions of the array, support for which can be found throughout the parent Application including the Background of the Invention section, the Drawings, and in the Experimental Details beginning on page 22. Specifically, support for the idea that each compound is represented at least twice within the array can be found on page 11, lines 20-21, and on page 16, lines 21-24, of the parent application, which describe the various compound repeat times of different libraries. Support for new claims 51 and 52 can also be found in these same section of the parent application for the synthesis of a combinatorial library on a linear fiber as described in the parent application could be repeated numerous times to give multiple copies of each member of the library on the array. The method

of synthesis as described in the Examples of the parent application would yield the periodicity as recited in claim 52. Applicant respectfully submits that these new limitations and new claims are supported by the Specification and would be recognized by one of ordinary skill in the art reading the Specification, which incorporates by reference the parent application.

**II. Rejection under 35 U.S.C. § 112, second paragraph, as being indefinite.** Claims 1, 30-32, 36, 37, and 43-46 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Examiner states that the language “the peptides and proteins are not intermediates leading to a single final product” is “confusing as it is unclear as to applicant’s intent.” Applicant submits that claims 1 and 30 would be definite and not confusing to one of ordinary skill in the art reading the claims in light of the Specification. As pointed out above, the peptides comprising the array of the claimed invention are all approximately the same size and are not a series of intermediates leading the sequence of a final peptide. That is, the peptides of the array will be approximately the same number of amino acids. The array will not have peptides of 1 amino acids, 2 amino acids, 3 amino acids, and so forth on the optical fiber array. Furthermore, the sequences of the peptides of the present invention can be different. If the peptides were just intermediates each smaller peptide would just be a sub-sequence of the final product peptide or protein. Applicant submits that since one of skill in the art would not be confused when reading the claim, the rejection should be removed.

Applicant has amended claim 32 so that it does not lack antecedent basis for the term “library;” therefore, applicant requests that the rejection be removed.

Examiner has objected to the use of the terms “linear organization” in claims 1, 30, 31, 32, and 50; “one-dimensionally” in claim 36; and “arranged linearly” in claim 37. Examiner states that it is unclear what the meaning of these terms is and what the difference is between them. Although Applicant believes none of these terms to be confusing and submits that each of them describes how the peptides are organized in a sequential fashion on the optical fiber which

is linear, Applicant has canceled claims 36 and 37 in order to avoid any possible confusion and to further prosecution.

Claims 43-46 have been rejected by the Examiner because the terms “first synthesis product,” “second synthesis product,” and “chemical structures” are unclear. Applicant has amended these claims to recite peptides or proteins and amino acid sequence in order to obviate this rejection. Applicant submits that the claims as amended are clear and definite and requests that the rejection be removed.

**III. Rejection under 35 U.S.C. §103, as being unpatentable over Browne et al. (Anal. Chem. 1996) in view of others.** Claims 1, 3, 4, 6-8, 13, 30-37, and 42-50 have been rejected under 35 U.S.C. § 103(a), as being unpatentable over Browne *et al.* (*Anal. Chem.* 1996) in view of Pirrung *et al.* (US Patent 5,143,854). The teachings of two of these references have been discussed in previous Responses, and Applicant submits that the amended base claims to a linear array of at least two chemical compounds with the limitation, “wherein the peptides or proteins are not intermediates leading to a single final product,” “wherein the peptides or proteins are members of a combinatorial library,” and wherein each peptide or protein is represented within the array at least twice at discontinuous regions of the array is not taught or suggested by any of the cited references even when they are combined. Neither reference can teach the claimed invention of a combinatorial library of compounds that are not intermediates leading to a single final product arranged as a linear array, *in which each peptide or protein is represented at least twice*. Since the references even when combined do not teach the limitation wherein the compounds are represented at least twice on the array, Applicant requests that the rejection be removed. Even in view of Pilevar *et al.* (*Anal. Chem.* 1998) or Lebl (U.S. Patent 5,688,696), the combined reference do not teach that each peptide or protein is represented at least twice.

Furthermore, with respect to new claim 51 and 52, none of the references even when combined teach or suggest each peptide or protein being present in the array at least three times. Also, there is no teaching of the limitation in claim 52 of periodicity of each occurrence of a peptide or protein. Given these substantial structural differences between the claimed invention and the cited art, Applicant respectfully submits that the cited art does not teach or suggest the claimed invention even when the references are combined.

One of the advantages of having the peptides or proteins of the combinatorial library represented more than once in the linear array is that the whole array can be analyzed quickly and accurately using Fourier transform analysis for specific structure-function relationships. This is quite elegantly demonstrated by the disclosure of the present application as well as in the Examples of the parent application starting on page 22. Using a linear array as a method of organizing a combinatorial library allows one to evaluate the full library. This is one of the major goals of combinatorial chemistry—to be able to produce millions of chemical compounds and fully analyze the library for compounds with a desired property. Also, the analysis includes the ability to determine which structural features within the library increase or decrease the desired property. Up until the work of Schwabacher *et al.*, no one was able to screen an entire combinatorial library for detailed structure-function data. Schwabacher's use of linear arrays and Fourier transform combinatorial chemistry allowed combinatorial chemists to finally realize this long sought goal in combinatorial chemistry.

None of the cited references even in combination would lead to the ground-breaking invention of linear arrays of combinatorial libraries which can be produced and analyzed in a manner not available to standard two-dimensional arrays of combinatorial libraries. In light of this important contribution to the field of combinatorial chemistry, Applicant is entitled to the broadest scope possible.

In light of the fundamental differences between what is claimed in the present application and the teachings of the cited references as well as the lack of motivation to combine these references, Applicant requests that the rejection under § 103 be removed.

In view of the forgoing arguments, Applicant respectfully submits that the present case is now in condition for allowance. A Notice to that effect is requested.

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Respectfully submitted,

  
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